Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

NOTES AND QUERIES.

Mr. James Meikle, of the Scottish Provident Institution, sends us the following method by which, as he says, a very close approximation may be made to the rate of interest in a life annuity.

Let A′ be the annuity of which the rate of interest is required;

A an annuity near to the above, at a known rate of interest;

$$\text{Then } A' = AE^{\frac{\Delta v \,.\, S_x}{v \,.\, A \,.\, D_x}};$$

$$\therefore\ \Delta v = \text{Log.}_e \left.\overline{\frac{A'}{A}}\right| \,.\, \frac{D_x\ v \,.\, A}{S_x}.$$

The value of Δv will be slightly short of the truth; but the following examples will show the extent of the error:—

Δv by the above formula, between Carlisle 4 per cent. and Carlisle $4\frac{1}{2}$ per cent., at ages

$$\left.\begin{array}{r} 90 = 0045958 \\ 60 = 0045638 \\ 30 = 0045121 \\ 0 = 0044864 \end{array}\right\} \text{ so that the error is only } \left\{\begin{array}{l} \cdot 0000049 \\ \cdot 0000369 \\ \cdot 0000886 \\ \cdot 0001143 \end{array}\right.$$

$$\text{True value} = 0046007$$

We have also, from the same gentleman, a method of determining the rate of interest in a life annuity when the table of mortality and age only are given; for which, however, we must endeavour to find room in a future Number.

Assurances are becoming frequent on one life against another, and for n years longer. The following is a simple means of approximating very closely to the annual premium for such risks.

Let p be the annual premium for assurance of £1 on the life of A_x against that of B_y; find the number of years they may expect to continue in being together, and call it z; let s be the single premium for £1 assurance on the life of A_{x+z} for the term n: then the annual premium required will be $p+p's$, p' being that for assurance of £1 on B_y against A_x. Of course the payment of premium will here cease with the joint duration of the lives; but should the value of the payment be desired, when it is to continue during A's life only, it can easily be obtained by means of the formula $\pi \,.\, \frac{(1+AB)}{1+A}$, where $\pi = p + p's$.

(For a neat and exact solution of this problem, *see* Mr. Hardy's letter in vol. ii. of this *Journal*, page 91.)